

Príklad

Vypočítajte $\int_0^1 x \ln x dx$.

Riešenie

Použitím metódy per partes dostávame

$$\begin{aligned}\int_0^1 x \ln x dx &= \lim_{a \rightarrow 0} \int_{0+a}^1 x \ln x dx = \lim_{a \rightarrow 0} \left[\frac{x^2}{2} \ln x - \frac{x^2}{4} \right]_{0+a}^1 = \lim_{a \rightarrow 0} \left[\frac{1}{2} \ln 1 - \frac{1}{4} \right] - \lim_{a \rightarrow 0} \left[\frac{a^2}{2} \ln a - \frac{a^2}{4} \right] = \\ &= -\frac{1}{4} - \lim_{a \rightarrow 0} \frac{\frac{\ln a}{\frac{1}{a^2}}}{\frac{-4}{a^3}} = -\frac{1}{4} - \lim_{a \rightarrow 0} \frac{a}{-4} = -\frac{1}{4}.\end{aligned}$$